



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/842,955	04/25/2001	Osamu Koshiba	TI-29265	8656
23494	7590	10/05/2005	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			LE, VU	
			ART UNIT	PAPER NUMBER

2613

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.	Applicant(s)	
09/842,955	KOSHIBA ET AL.	
Examiner	Art Unit	
Vu Le	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-8 is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, see Appeal Brief filed July 11, 2005, with respect to the rejection(s) of claim(s) 1-2 under 102(b) have been fully considered and are persuasive. An appeal conference conducted with two Supervisors (SPEs) resulted in favorable reconsideration on applicant's behalf. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Zhang et al, US 6,037,986.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al, US 5,990,962 in view of Zhang et al, 6,037,986.

*This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).*

Re claim 1, Ueno et al discloses a method of preprocessing for motion-compensated video encoding (fig.1 and/or 2) comprising:

(a) providing a frame in a video sequence for motion-compensated encoding ("INPUT");

(b) for a pixel in said frame, comparing a difference between (i) the value of said pixel and (ii) the predicted value of said pixel from motion compensation prediction of said frame to a first level (col.7, lines 13-17, note: in Ueno, the motion compensation prediction error is the difference between a pixel value of the input video frame and a pixel value of the motion compensated predicted picture);

(c) when said comparing of step (b) indicates said difference is greater than said first level, apply lowpass filtering to said pixel (col. 6, lines 22-25, col. 7, lines 17-20, note: in Ueno, the comparison to a predetermined threshold value inherently determines whether motion compensation prediction error is greater than said threshold prior to lowpass filtering) ;

and (d) repeating steps (b)-(c) for other pixels of said frame (fig. 1 and/or 2, note: in Ueno, preprocessing 11 is inherently an iterative process); (e) motion-compensated encoding of said frame after said filtering (12).

In Ueno et al, motion compensation and lowpass filtering decision are carried out at the block level, and not at the pixel level as required in steps b-d as claimed.

However, Zhang et al teaches that lowpass filtering decision at the preprocessor may be done at "per-pixel" level so that the filtered image preserves edges and contours in the original image while also removing many undesirable high frequency

components. (See figs. 2-3: 23, col. 3, line 6-10, "Summary of the Invention", col. 6, line 25 to col. 7, line 62, col. 12, line 11-21).

Therefore, taking the combined teaching of Ueno et al and Zhang et al as a whole, it would have been obvious and advantageous to modify motion compensation and lowpass filtering decision in Ueno et al to perform at "per-pixel" level as taught in Zhang et al for the benefit of obtaining a filtered image that preserves edges and contours in the original image while also removing many undesirable high frequency components.

Re claim 2, the method of claim 1, wherein: (a) said filtering of step (c) of claim 1 is filtering is both spatial in said frame and temporal over other frames of said video sequence (See Ueno et al, fig. 1:14, col. 6, lines 4-25, Note: in Ueno, the filter 14 acts to filter spatially the input image signal, and temporally, the motion compensated predicted signal. Zhang et al also teaches filtering in both spatial and temporal domain, see "Summary of the Invention").

***Allowable Subject Matter***

4. Claims 3-4 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

For claims 3-4, the prior art of record fails to anticipate or render obvious the limitations as claimed:

"(a) for said pixel, comparing said difference to a second level which is less than said first level; and (b) when said comparing of step (a) indicates said difference is greater than said second level but less than or equal to said first level, comparing the magnitude of the motion vector for the block containing said pixel to a first threshold; (c) when said comparing of step (b) indicates the magnitude of said motion vector is greater than said first threshold, spatial lowpass filtering to said pixel; and (d) wherein said step (e) of claim 1 encoding applies to said frame after filtering by both steps (b)-(d) of claim 1 and foregoing steps (a)-(c)."

5. Claims 5-8 are allowed.

The prior art of record fails to anticipate or render obvious the limitations as claimed:

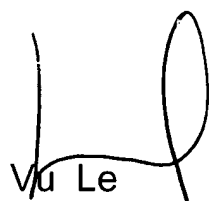
"...comparing a first difference between (i) the value of said pixel and (ii) the value of said pixel in a frame prior to said frame to a temporal threshold; (c) when said comparing of step (b) indicates said first difference is greater than said temporal threshold, comparing a second difference between (i) the value of said pixel and (ii) the predicted value of said pixel from motion compensation prediction of said frame to a first level; (d) when said comparing of step (b) indicates said second difference is greater than said first level, apply lowpass filtering to said pixel; and (e) repeating steps (b)-(d) for other pixels of said frame; (f) motion-compensated encoding of said frame after said filtering."

### **Contact**

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vu Le whose telephone number is (571) 272-7332. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Vu Le  
Primary Examiner  
AU 2613  
(571) 272-7332  
[Vu.Le@uspto.gov](mailto:Vu.Le@uspto.gov)